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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,407	06/06/2000	Richard D. Blackmore	240-P-028	9445

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EXAMINER

MAKI, STEVEN D

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 03/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/588,407

Applicant(s)

BLACKMORE ET AL.

Examiner

Steven D. Maki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 12-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: \_\_\_\_

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1) Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-6, 12-19, and 20, drawn to heating device, apparatus for insitu repair of conduit, method for repairing damaged section of conduit respectively, classified in class 156, subclass 294.

II. Claims 7-11, drawn to process of forming inflatable heating device, classified in class 264, subclass 405.

2) The inventions are distinct, each from the other because:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the composite product (the heating device) can be made by a materially different process such as curing the matrix by applying external heat from a heating means such as an oven.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

3) During a telephone conversation with Richard Himelhoch on 12-13-01 a provisional election was made with traverse to prosecute the invention of Group I,

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claims 1-6 and 12-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-11 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

- 4) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 5) Claims 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 17, it is not clear what additional limitation is being claimed.

- 6) Claim 17 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 17 merely describes the product worked on instead of an additional limitation.

- 7) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 8) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Davis et al

9) **Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Davis et al (US 5,259,901).**

Davis et al discloses an inflatable bladder comprising a helical graphite fiber in a silicone elastomer matrix.

In the preamble, the description of the inflatable device being an "inflatable heating device" (emphasis added) relates to the intended use and fails to require a power source connected to the carbon fiber.

Davis et al discloses an inflatable mandrel comprising a matrix material such as silicone elastomer and reinforcement fiber wherein the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The reinforcing fiber may be a graphite fiber. See col. 7 lines 47-50.

In claim 1, "carbon fiber" reads on --graphite fiber--. In any event: As to claim 1, it would have been obvious to use a carbon reinforcing fiber as the fiber in the inflatable mandrel (bladder) of Davis et al since (a) Davis suggests using a reinforcing fiber such as a graphite fiber in the inflatable mandrel (bladder) and (b) it is taken as well known / conventional per se in the composite art that carbon fibers and graphite fibers are alternative reinforcing fibers for composite material.

As to claim 1, the description of the inflatable device being an "inflatable heating device" (emphasis added) in the preamble relates to the intended use and fails to

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require a power source connected to the carbon fiber. The inflatable device claimed in claim 1 therefore fails to require "means such as power source connected to the carbon fiber" not shown by Davis et al. In other words, claim 1 reads on a mandrel which is merely inflatable. Claim 1 fails to require either directly or indirectly heating of the bladder.

As to claims 4-6, note Davis et al's teachings regarding the reinforcing fiber. In any event: The limitation of the fibers being at  $\pm 45$  degrees (claim 4) / the 50-90% coverage (claim 5) would have been obvious in view of Davis et al's teaching that the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows, bundles, or non-woven tape.

**10) Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (US 5,259,901) as applied above and further in view of Europe '761 (EP 432761), Guenther et al (US 5,216,085) or Rianda (US 4,792,374).**

As to claims 2 and 3, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder of Davis et al in view of Europe '761, Guenther et al or Rianda – Europe '761 suggesting use of fluorosilicone for a bladder, Guenther et al suggesting the use of fluorocarbon for a bladder and Rianda suggesting the use of fluorosilicone for a bladder.

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11) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Barton et al

12) **Claims 12, 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (US 4,995,761) in view of Japan '323 (JP 2-158323) and Japan '334 (JP 2-150334) and one of "Wood et al (US 5,706,861), Hollingsworth (US 5,266,137), Guenthner et al (US 5,216,085) and Rianda (US 4,792,374)" and optionally PCT (WO 93/06410).**

Barton discloses heating an inflatable bladder during repairing a pipe. Japan '323 and Japan '334, which are in the same field of endeavor as Barton, suggest using heating elements in the bladder of Barton to obtain the heating of the bladder desired by Barton. The use of thermoset resin for the bladder is suggested by and is nothing more than the use of the usual material used for bladders as evidenced by Wood et al, Hollingsworth, Guenthner et al and Rianda. The combination of the applied prior art is described in more detail below:

Barton discloses an apparatus for repairing a conduit comprising a bladder 52 made of "resilient, flexible material such as rubber or various types of plastic which may be conveniently inflated and deflated (col. 4 lines 9-12); a first plug 54; a second plug 56; wherein the plugs 54 and 56 are connected in any air tight manner to opposing ends of the bladder 52. An air inlet 71 is formed through plug 54 and communicates with a

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pump which inflates and deflates the bladder. Barton teaches applying hardening material such as epoxy resin to a sleeve 72, placing the sleeve on the bladder, interconnecting (removably attaching) the sleeve to the plug 54, introducing the apparatus into the conduit, using the pump to inflate the bladder and press the sleeve against the inner surface of the conduit, and accelerating the curing of the sleeve by pumping hot air into the bladder.

Barton does not specifically recite using elastomeric composite, which includes a heating element disposed in a thermoset resin matrix, as the bladder.

As to claims 12 and 17, it would have been obvious to one of ordinary skill in the art to use a composite, which includes heating element disposed in a matrix material, as the bladder of Barton which is used for heating the repair material comprising the sleeve and the thermosetting resin and to provide the plug with a corresponding cable port for supplying current to the heating element since:

(a) Japan '323 suggests applying electric current to conductive material in a heating tube (bladder) to heat a lining material which is impregnated with thermosetting resin;

(b) Japan '334 suggests applying current to a cylindrical cloth of an expandable body 4 (bladder) which is illustrated as having the cloth 7 therein to heat repairing material comprising a sleeve and thermosetting adhesive.

Hence, each of Barton, Japan '323 and Japan '334 are directed to lining / repairing a conduit with lining material which comprising thermosetting material. Barton teaches using a bladder to apply pressure. Barton teaches heating the bladder (albeit with hot

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air instead of with heating element in the bladder) to heat and cure the resin. Japan '323 and Japan '334, which are in the same field of endeavor as Barton, motivate one of ordinary skill in the art to accomplish the step of heating the bladder by incorporating conductive heating elements in the bladder. The motivation is expressed by Japan '323 as an increase in work efficiency (uniform cure) and reduction of cost.

As to the matrix being a thermoset resin matrix, it would have been obvious to one of ordinary skill in the art to use thermoset resin matrix such as silicone for the bladder since (a) Barton teaches composing the bladder of a "resilient, flexible material such as rubber or various types of plastic [resin] which may be conveniently inflated and deflated" and (b) thermoset resin matrix such as silicone matrix is well known / conventional materials per se for an inflatable bladder as evidenced by one of Wood et al (silicone at col. 4), Hollingsworth (silicone at col. 4), Guenther et al (fluorocarbon at abstract, col. 2) and Rianda (silicone or fluorosilicone at col. 9).

As to vacuum port, it would have been an obvious alternative to provide an air port and a vacuum port instead of a single port for alternately supplying air and a vacuum to the bladder to inflate and deflate the bladder since it is taken as well known / conventional in the lining art to provide a port for inflating a bladder and a separate port for deflating the bladder.

As to claim 13, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder of Davis et al in view of Guenther et al or Rianda – Guenther et al suggesting the use of fluorocarbon for a bladder and Rianda suggesting the use of fluorosilicone for a bladder.

As to claim 17, the prepeg is not part of the claimed apparatus.

Although not clearly claimed, it would have been obvious to use carbon fiber as the heating element since PCT, directed to the repair art as is Barton, suggests using graphite fiber as a heating element – it being taken as well known / conventional per that carbon fibers and graphite fibers are alternative conductive fibers for use as heating elements.

13) **Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (US 4,995,761) in view of Japan '323 (JP 2-158323) and Japan '334 (JP 2-150334) and one of "Wood et al (US 5,706,861), Hollingsworth (US 5,266,137), Guenther et al (US 5,216,085) and Rianda (US 4,792,374)" and optionally PCT (WO 93/06410) as applied above and further in view of Baker et al (US 4,191,383).**

As to claims 14-16, it would have been obvious to provide the heating elements in the form of a sleeving comprising braided conductive fibers since (a) Japan '334 suggests disposing heating elements in the bladder such that the heating elements are in the form of a conductive cloth which one of ordinary skill in the art would readily understand as comprising conductive fibers and (b) Baker et al suggests incorporating braided material in an inflatable packer (bladder). The use of two types of fibers (glass fibers and fibers) would have been obvious since it is taken as well known / conventional per se in the lining art to include glass fibers and conductive wires in a bladder for lining a duct.

14) **Claims 1-6 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (US 4,995,761) in view of Japan '323 (JP 2-158323) and**

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**Japan '334 (JP 2-150334) and one of "Wood et al (US 5,706,861), Hollingsworth (US 5,266,137), Guenther et al (US 5,216,085) and Rianda (US 4,792,374)" and optionally PCT (WO 93/06410) as applied above and further in view of Davis et al (US5,259,901).**

Davis et al discloses an inflatable mandrel comprising a matrix material such as silicone elastomer and reinforcement fiber wherein the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The reinforcing fiber may be a graphite fiber. See col. 7 lines 47-50.

As to claims 1-6 and 18-19, it would have been obvious to incorporate the carbon fiber in the bladder of Barton using helical winding since Davis et al suggests using helical winding to incorporate a fiber in an inflatable bladder. As to claims 4-6, note Davis et al's teachings regarding the reinforcing fiber. In any event: The limitation of the fibers being at  $\pm 45$  degrees (claim 4) / the 50-90% coverage (claim 5) would have been obvious in view of Davis et al's teaching that the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows, bundles, or non-woven tape. The use of two types of fibers (glass fibers and fibers) would have been obvious since it is taken as well known / conventional per se in the lining art to include glass fibers and conductive wires in a bladder for lining a duct.

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15) **Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (US 4,995,761) in view of Japan '323 (JP 2-158323) and Japan '334 (JP 2-150334) and one of "Wood et al (US 5,706,861), Hollingsworth (US 5,266,137), Guenther et al (US 5,216,085) and Rianda (US 4,792,374)" and optionally PCT (WO 93/06410) as applied above and further in view of Lippiatt (US 5,199,463).**

As to claims 17 and 20, it would have been obvious to removably attach a prepreg comprising fibers and thermosetting resin since (a) Barton suggests removably attaching a sleeve having thermosetting resin applied thereto and (b) Lippiatt, also directed to repairing conduits, suggests removably attaching lining material in the form of a prepeg (fibrous material impregnated with heat curable resin) to a bladder using loose ties.

#### Remarks

16) The remaining references are cited of interest.

17) No claim is allowed.

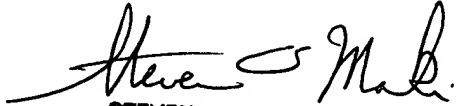
18) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is 703-308-2068. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Steven D. Maki  
March 11, 2002

  
**STEVEN D. MAKI**  
**PRIMARY EXAMINER**  
~~**GROUP 1300**~~  
AU 1733 3-11-02